[0032] FIG. **1** is a block diagram illustrating a driver circuit according to example embodiments of inventive concepts;

[0033] FIG. **2** is a block diagram illustrating an application of a driver circuit according to example embodiments of inventive concepts;

[0034] FIG. **3** is a block diagram illustrating an application of a driver circuit according to example embodiments of inventive concepts;

[0035] FIG. **4** is a circuit diagram illustrating an amplifier of a charge control circuit according to example embodiments of inventive concepts;

[0036] FIG. **5** is a diagram illustrating an application of a driver circuit according to example embodiments of inventive concepts;

[0037] FIG. **6** is a block diagram illustrating an application of a driver circuit illustrated in FIG. **5**;

[0038] FIG. **7** is a block diagram illustrating another application of a driver circuit illustrated in FIG. **5**;

[0039] FIG. **8** is a block diagram illustrating an application of a driver circuit illustrated in FIG. **7**;

[0040] FIG. **9** is a block diagram illustrating a nonvolatile memory device to which a driver circuit according to example embodiments of inventive concepts is applied;

[0041] FIG. **10** is a circuit diagram illustrating a memory block according to example embodiments of inventive concepts;

[0042] FIG. **11** is a block diagram illustrating a part of a page buffer circuit to which a driver circuit according to example embodiments of inventive concepts is applied;

[0043] FIG. **12** is a block diagram illustrating a part of a row decoder circuit to which a driver circuit according to example embodiments of inventive concepts is applied;

[0044] FIG. **13** is a block diagram illustrating another example of a nonvolatile memory device to which a driver circuit according to example embodiments of inventive concepts is applied;

[0045] FIG. **14** is a circuit diagram illustrating a memory tile according to example embodiments of inventive concepts;

[0046] FIG. **15** is a block diagram partially illustrating a row decoder circuit and a sense amplifier and write driver circuit to each of which a driver circuit according to example embodiments of inventive concepts is applied;

[0047] FIG. **16** is a block diagram illustrating a storage device according to example embodiments of inventive concepts; and

[0048] FIG. **17** is a block diagram illustrating a computing device according to example embodiments of inventive concepts.

[0049] FIG. **18** is a block diagram illustrating an embodiment including a plurality of driver circuits according to example embodiments of inventive concepts.

DETAILED DESCRIPTION

[0050] Example embodiments will now be described more fully with reference to the accompanying drawings, in which some example embodiments are shown. Example embodiments, may, however, be embodied in many different forms and should not be construed as being limited to the embodiments set forth herein; rather, these example embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of example embodiments of inventive concepts to those of ordinary skill in the art. In the drawings, the thicknesses of layers and regions are exaggerated for clarity. Like reference characters and/or numerals in the drawings denote like elements, and thus their description may not be repeated.

[0051] It will be understood that when an element is referred to as being "connected" or "coupled" to another element, it can be directly connected or coupled to the other element or intervening elements may be present. In contrast, when an element is referred to as being "directly connected" or "directly coupled" to another element, there are no intervening elements present. Other words used to describe the relationship between elements or layers should be interpreted in a like fashion (e.g., "between" versus "directly between," "adjacent" versus "directly adjacent," "on" versus "directly on"). As used herein the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0052] It will be understood that, although the terms "first", "second", etc. may be used herein to describe various elements, components, regions, layers and/or sections. These elements, components, regions, layers and/or sections should not be limited by these terms. These terms are only used to distinguish one element, component, region, layer or section from another element, component, region, layer or section. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of example embodiments.

[0053] Spatially relative terms, such as "beneath," "below," "lower," "above," "upper" and the like, may be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. It will be understood that the spatially relative terms are intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements described as "below" or "beneath" other elements or features would then be oriented "above" the other elements or features. Thus, the term "below" can encompass both an orientation of above and below. The device may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein interpreted accordingly.

[0054] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of example embodiments. As used herein, the singular forms "a," "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises", "comprising", "includes" and/or "including," if used herein, specify the presence of stated features, integers, steps, operations, elements and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components and/or groups thereof. Expressions such as "at least one of," when preceding a list of elements, modify the entire list of elements and do not modify the individual elements of the list.

[0055] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which example embodiments belong. It will be further understood that terms, such as those defined in commonly-used dictionaries, should be interpreted as having a meaning